

## First Canadian Report of the Sacoglossan *Elysia chlorotica* GOULD

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UNTIL VERY RECENTLY the range of *Elysia chlorotica* GOULD, 1870, a large emerald green sacoglossan of brackish water, was reported as Massachusetts to New Jersey (JOHNSON, 1934; MINER, 1950). Even in the "Key to the Invertebrates of the Woods Hole Region" (R. I. SMITH, 1964) the reader is referred to MINER for distributional data. The genus is not listed in ABBOTT's "American Sea Shells" (1954 edition) although 34 genera of the closely related order of the nudibranchs are treated and figured. In 1960, PFITZENMEYER extended the range southward through the accidental discovery of several specimens in Chesapeake Bay, Maryland. A major northward range extension is reported here with the discovery of *Elysia chlorotica* in the salt marshes of the Minas Basin, Nova Scotia. A preliminary annotated list of the fauna of the Minas Basin (BOUSFIELD & LEIM, 1959) treated the mollusks in some detail but did not include any sacoglossans or nudibranchs.

For animals that prefer the pools and shallows of an intertidal habitat, the Minas Basin is an extremely demanding habitat. The mean tidal range is in the order of 38 feet which exposes some 153 square miles of the bottom of this 435 square mile basin twice daily. (The reader is referred to BOUSFIELD & LEIM for further hydrographic details.) Consequently, shallow water and tide pools are a fleeting thing on these well drained mud flats. The *Elysia* from Chesapeake Bay (PFITZENMEYER, op. cit.) were found associated with *Zostera*, *Potamogeton* and oyster shells, none of which occurs in the Minas Basin. The only standing water at low tide is firstly, minor pools around the bases of individual rocks scattered over the flats; secondly, even rarer pools in sandstone outcroppings; and thirdly, the permanent pools, ponds

and ditches in the extensive *Spartina* marshes that border much of the Minas Basin. Some 44054 acres of these Minas Basin salt marshes have been reclaimed by dykes for crop and pasture land thus destroying much of the original marsh land habitat.

The *Elysia* were first discovered in ponds and trenches six inches to three feet in depth and dominated by algae of the Cladophorales and the halophyte *Ruppia*. Since October 1965, many ponds have been examined at the west end of the Minas Basin but only two limited areas have thus far yielded specimens of *Elysia*. However, at these sites *Elysia* is common and occasionally abundant. Nevertheless, even within one pond this large slug has often been found more easily in a restricted area of the pond and often not at all a few feet away. This may account for the inability to find specimens in January, 1966, when an ice cover of 9 $\frac{3}{4}$  inches was over one particular pond. Two holes were cut through the ice, but no *Elysia* could be fished out with random scoops of algal masses. Yet on March 15 the ice was gone and adult *Elysia* were again evident. On May 31 strings of eggs were noted for the first time and were found attached to algal filaments and to the *Ruppia*.

Most surprising was the discovery on several occasions in July and August 1966 of many small *Elysia* on mats of *Vaucheria*, which has not previously been reported for this species. They were usually found in damp depressions around the bases of the *Spartina*, but were nevertheless exposed to the air and the euryhaline extremes of rain and high tides. In both Europe and North America *Vaucheria* alga is considered the natural microhabitat of another slug, *Alderia modesta* LOVÉN, 1844. We did find

this latter species at the same time and often in company with *Elysia*.

From the limited literature on the species it is apparent that it can exist over an amazing gamut of habitats; it can tolerate wide fluctuations in salinity, temperature, oxygen; it can be dredged from ten feet of water or taken in brackish ponds or on exposed cushions of *Vau-cheria*; it is active throughout the year, and both during

the day and at night; and it frequents a variety of substrates and a variety of plants. In spite of such wide ranges of environmental tolerance, it is, nevertheless, particularly sensitive to some factor or factors, and in the Minas Basin at least it has a more limited and discontinuous distribution at the local level than other species of mollusks that one usually considers as good examples of stenoeccious organisms.

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